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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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RECORDS.

The note by Mr. Wm. Scott upon the induction of premature labour or abortion in the mare and cow, which we published last week, is of value on account of the meagreness of the literature on the subject. The procedure is classic in our text-books on obstetrics; but, outside those, hardly anything has been written regarding it. It has certainly never become general in our work; and probably very few practitioners have ever thought of attempting it. How many of those who have thought of it have put it in practice is a question not answered by the mere dearth of clinical records. Yet a little reflection will convince anyone that the subject is one with which every practitioner in a breeding district ought to be acquainted.

The operation never will be, and never ought to be, practised by us so frequently as it is by medical men. Their sole object is to save the life of the mother. To us, the more important question is whether the mother, if she survives, will ever again be a useful animal; and the answer to this will very often contra-indicate the operation. There are occasional cases in which it would yield good results; and, used with discretion, it should be a valuable addition to the resources of the country practitioner. Mr. Scott has done good service by showing us its possibilities, which many of us had never realised.

It is distinctly dispiriting to think how many veterinary surgeons are silently doing things which others never dream of attempting, and how much we others lose through their silence. A man who attempts little on his own initiative, and hears little of what others are doing, sometimes loses sight of the possibilities of practice to an almost incredible extent. We have known a veterinary surgeon of long experience in country practice, a man well known and deservedly respected in the profession, who had never excised the everted uterus of a cow, and believed that the operation could not possibly be successful. We know another who has performed the same operation some fifteen times, and is well satisfied with its results; but he cannot be induced to put this, or any other part of his professional experience upon record. We all know how common that attitude is amongst practitioners but very few will ever recognise how greatly its general adoption has impeded our professional advancement. While those who have special knowledge of any subject keep it to themselves, the bulk of the profession inevitably remain unenlightened on many questions regarding which they need information. The recording of results is a duty every practitioner owes to his profession.

VESICULAR STOMATITIS CONTAGIOSA.

By JAMES GREGG, M.R.C.V.S., British Remount Commission Laboratory, Newport News, Virginia, U.S.A.

This disease, I think, is of American origin. However, a note on it may be of some interest to those handling American horses and mules at ports of entrance at home.

If we leave out the feet, the description of the mouth in Foot-and-Mouth Disease will answer very well—of course, there are no feet lesions.

The cause may be guessed by the bacteriological notes.

The prevention: up to date, is isolation and good sanitation.

The susceptibility is 85 per cent. in horses, 75 per cent. in large mules, and 25 per cent. in small mules.

The period of incubation averages three days, starting with an inflamed mouth, then in a short time the formation of vesicles on the sides and point of the tongue, and sometimes on the lips—these break almost immediately, leaving red, inflamed surfaces. Constitutional disturbance is slight.

Period of attack averages one week. Animals usually eat a little, but fall off considerably in condition.

Treatment consists of hyposulphite of soda in drinking water, with weak gargles of permanganate of potash and alum once a day.

Bacteriology.

The organism isolated in this condition is a micrococcus, which was obtained in pure culture by withdrawing under aseptic conditions the material from unruptured vesicles occurring chiefly on the tongue. Transfer of this exudate, a sero-turbid fluid, was made into nutrient broth and upon glycerine agar. After incubating these tubes for five days a few very small dewdrop-like colonies appeared on the glycerine agar slant. No growth could be detected in the bouillon, though they were incubated for some time and repeated tests were made upon them. Cultural media to which 6 per cent. glycerine has been added favours the growth of this organism.

Morphology. A large micrococcus, varying from 1 to 1.5 microns in diameter. Its arrangement is generally in clumps: no chains have been observed. It stains uniformly and with all ordinary stains. It is gram positive.

Glycerine and Agar Stroke. Growth upon this medium is moderate, the line of inoculation taking on a beaded appearance, with small, convex, glisten-

ing translucent colonies. The incubation period is from 48 to 72 hours before growth is visible.

Loeffler's Blood Serum. A peculiar feature of the organism is that upon this medium there is a very scant growth, parts of the surface losing their lustre, with no indication of raised or distinct colonies.

Glycerine Agar Stab. The growth was best at the top, but was of a restricted character. The line of puncture was filiform. The organism produced no change in either plain or litmus milk. In carbohydrate media no fermentation was produced, and no liquefaction in gelatine.

In the laboratory animals no effect was produced by injecting 25 minims of a heavy suspension of the micrococcus in the peritoneal cavity of rabbit or guinea pig.

The organism does not seem to be very hardy, for out of five cultures left alone for ten days only one had live organisms in it at the end of that time.

A mild form of the Disease produced.

After growing the organism for about three months, covering many generations, we tested the cultures on seven mules that had been in the hospitals for about three months, owing to various forms of lameness. These animals were more or less in contact but had not contracted the disease, and were, therefore, considered immune to natural infection.

The cultures were washed off with normal salt solution and administered as follows;—

1. Four mules had 1 c.c. each, rubbed around the tongue and lips, with negative results four days after the experiment; on sixth day three of them had inflammation of the mouth and mild salivation.

2. One mule had 2 c.c. (or over four billion organisms) injected into the jugular vein with positive results in forty-eight hours. The veins and lymphatics under the tongue became corded, and the mucous membrane of the mouth very much inflamed. Salivation was copious. Temperature was one degree above normal. This condition remained for two days; at present the mouth is becoming normal and the temperature has gone down to-day (16th February).

3. Two mules had 6 c.c. (or over twelve billion organisms) each, injected into the side of the tongue at three different places. After twenty-four hours there were pronounced nodules about the size of the top of one's finger at the seat of each injection. After 48 hours one of these began to soften in one mule, forming a vesicle. After 72 hours there was severe inflammation of the mouth and salivation. In the other mule two of the nodules had undergone the same change, but the mouth was not inflamed after 72 hours. We then proceeded to extract a little of the cloudy aqueous contents from the vesicles in each mule to examine for the organism, The result was gratifying from our standpoint, inasmuch as we were able to isolate the original organism in plentiful supply.

The work is proceeding, and further experiments will be set up.

I am indebted to Dr. G. Gregory, our bacteriologist, for most of the work on this note.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

[National V.M.A.—Northern Branch.]

The annual meeting was held at the Grand Hotel, Birmingham, on Friday, Feb. 16th, Mr. John Malcolm, President, in the Chair, and there were also present the following members: Messrs. Trigger, Newcastle-under-Lyne; A. Renfrew, Broadway; J. Martin, Wellington, Salop; J. A. Gold, Redditch; F. L. Gooch, Stamford; J. Cormack, Coventry; B. Secker, Malvern Link; H. S. Yeomans, Smethwick; A. Over, Rugby; H. B. Hiles, Worcester; W. H. Brooke, Handsworth; W. E. Ison, Atherstone; R. Murray, Rugeley; W. W. Grasby, Daventry; W. L. Gascoyne, Lutterworth; T. J. Marriott, Northampton; W. Dale, Coventry; J. R. Conchie, Kidderminster; J. O. Powley, Sutton Coldfield; L. C. Tipper, E. O'Neill, S. M. Woodward, J. Whyte, J. Young, C. J. Byner, Birmingham; J. J. Burchnall, Hon. Treas., Barrow-on-Soar; H. J. Dawes, Hon. Sec., West Bromwich. The following visitors were welcomed: Sir Stewart Stockman, Chief Vety. Officer of the Board of Agric., London; Maj. Mulvey, Chelmsford; Messrs. Eaton Jones, Liverpool; W. Reekie, London; W. Smart, Bd. of Agric., London; E. R. Edwards, Bd. of Agric., Manchester; C. Wood Page, Banbury; G. H. Jelbart, Stow-on-the-Wold.

Apologies for unavoidable absence, were received from Prof. Dewar, Messrs. R. L. Phillips, F. W. Barling, F. B. O. Taylor, J. Bainbridge, E. Ringer, L. W. Heelis, R. Hughes, C. Parsons, J. Prickett, and others.

The circular convening the meeting was read and the minutes of the previous meeting were confirmed.

The Hon. Treas. read a letter from Mr. John Blakeway, who is in America, requesting that his name might be struck off the list of members, and he had replied that he did not think the Association would agree.

The Hon. Sec. said every member would regret to lose the name of Mr. J. Blakeway from the membership list, and he moved that Mr. Blakeway be asked to reconsider his decision. No one had done more for this Association than Mr. Blakeway. (Hear, hear.) Mr. Tipper seconded.

Mr. Trigger said they simply could not allow Mr. Blakeway to resign.

The President said he agreed with every word that had been said. He put the motion to the meeting and it was carried unanimously.

A nomination. Mr. Woodward nominated for membership of the Association Mr. Hedley Arnold Turner, Vety. Dept., Midland Railway, Derby. Mr. Turner's name will be voted upon at the next meeting.

Financial Statement: a War Loan Investment.

The Hon. Treas. presented his annual statement, duly audited.

	£	s.	d.
To Balance from previous year	183	14	11
Subscriptions and Entrance Fees	36	10	0
Bank interest	3	17	6
	£224	2	5

Payments.	£	s.	d.
By N.V.M.A. Affiliation Fee	3	15	0
Ann. Sub., Victoria Vety. Benevolent Fd.	5	5	0
Don., Anglo-Franco-Belgian Relief Fund	10	10	0
Secretary's expenses	18	5	6
Treasurer's expenses	1	3	6
Balance in hand	185	3	5
	£224	2	5

Mr. BURCHNALL explained that the decrease in the subscriptions was not due to any falling off in the membership, but to remissions in the cases of members with the Forces.

Mr. TRIGGER: What do we get for the £3 15s. to the National Veterinary Association?

Mr. BURCHNALL: I really can't say. The subscription is paid in accordance with a decision come to some years ago.

Mr. TIPPER suggested that part of the balance should be invested in the War Loan. There was just time to do it.

This met with general assent, and to put it in order, a resolution was moved by Mr. O'Neill, seconded by Mr. Tipper, and carried unanimously, that £100 be so invested, and this was arranged for.

Officers re-elected. The HON. SEC. presented the report of the Council, whose meeting was held immediately prior to the general meeting. The Council recommended the next quarterly meeting be held in Birmingham, that the subject for discussion be cases brought forward by members, and that in accordance with a previous resolution not to change the Executive of the Association during the war, the whole of the officers be re-elected for the ensuing year.

Mr. TIPPER moved that the report be adopted, this was seconded by Mr. Gooch, and carried unanimously.

Mr. TRIGGER, in moving a vote of thanks to the officers for their services during the past year, said they were all very glad to know that Mr. Malcolm was continuing in the chair for another twelve months. "Mr. Malcolm was Secretary when I was President in the eighties," added Mr. Trigger, "and he has maintained his interest in the Association ever since." They were also very much indebted to Mr. Dawes for the work he performed with so much ability, and to Mr. Burchnall, their Treasurer: two very excellent officers whom it would be most difficult to replace. As for the other officers and the members of the Council, as he (Mr. Trigger) was one, he would only say of them that they did their best for the Association.

Mr. GOOCH seconded, and said they were exceedingly fortunate in having three such admirable executive officers as Mr. Malcolm, Mr. Dawes, and Mr. Burchnall.

The PRESIDENT briefly replied on behalf of himself and the other officers, who, he said, were well repaid in seeing the Association continue to flourish.

A USEFUL SYRINGE.

Sir STEWART STOCKMAN submitted for the inspection of those present a cheap syringe for giving large doses of vaccine or serum. It would administer 50 c.c. doses, and he was able to do 17 cattle in half-an-hour. It could be sterilised in the usual way by boiling, and was exceedingly simple. At present it might cost about 8s., but in peace time it ought not to be more than half that sum, and one could thus afford to break it.

The syringe was passed round and its simplicity and effectiveness were generally admired.

SWINE FEVER.

Mr. J. O. POWLEY, of the Board of Agriculture.

History. The earliest account of swine fever appears to be by Dr. Sutton, of Indiana, U.S.A., who described the condition in America in 1858.

In England, I cannot do better than quote from the Departmental Committee Report of 1893, which states: "Swine fever does not appear to have been recognised as a special disease till 1862, when Prof. Simonds investigated a virulent outbreak in Wiltshire. A fatal disease of the pig was known to the Bristol dealers under the name of Red Soldier, Red Disease, or Purples, for some time before that date, and there is no doubt it had a prior existence on the American and European Continents.

Up to 1878 S.F. was allowed to spread unchecked by any regulations.

After the passing of the 1878 Act several Local Authorities urged upon the Privy Council the importance of including S.F. in the definition of disease under the provisions of the Act. An order was accordingly passed, entitled the Typhoid Fever or Swine Order, dated December, 1878, providing for the slaughter of diseased swine by the L.A., who had already discretionary power to slaughter swine that had been in contact with diseased animals. The Order further provided that, no swine should be moved out of the pigsty, or other place where disease existed, or had existed within six days, without a licence, and then only for slaughter.

In 1879 the return showed that 53 counties had been infected, 2765 outbreaks occurred, and 17,074 swine had been attacked.

From 1878–1892 various measures for the suppression of S.F. were adopted by the Local Authorities under the orders of the Privy Council and the Board of Agriculture (formed in 1889). These measures included the slaughter of diseased swine, and of contact swine; the regulation of Sales and Markets, and the prohibition of the movement of swine into certain districts.

In the year 1892 there was a considerable reduction in the number of cases reported, which was probably more apparent than real, and due in some measure to a reduction in the number of swine in the country, and to a still greater extent to the discontinuance on the part of Local Authorities of the payment of compensation, which had the effect of making the owners of swine negligent in giving notice of the disease.

The extension of S.F. to Ireland was probably due to the importation of infected swine from some part of Great Britain. The disease was certainly prevalent in Ireland soon after it was recognised in England.

From 1892 till the present time, as you are all doubtless aware, the annual number of outbreaks has varied, and, despite the various administrative measures adopted, the disease is to-day almost as prevalent as at the commencement of hostilities against it.

ETIOLOGY.

The actual cause of swine fever has not yet been cleared up, and as the subject is of more than passing importance I propose to state at some length the opinions of the various authorities, as some most interesting facts have been discovered by the various investigators.

Up to the year 1905, the so-called Swine Fever Bacillus (B. Cholerae Suis) was looked upon as the causal organism of the disease, but several peculiarities had been noted by various investigators when working with this bacillus.

Dorset, Bolton, and MacBride, in U.S.A., noticed that when cultures of the B. Cholerae Suis were injected subcutaneously into pigs, only slight disturbance was usually produced, although after intravenous injections, or feeding, a severe illness frequently resulted. The disease produced in this manner may present the symptoms and lesions seen in swine fever, but does not possess the characteristics of contagiousness nor of infectiousness of the blood; nor are those pigs which have recovered from such illness immune when exposed subsequently to the natural disease. It was thus shown that pure cultures of the B. Cholerae Suis possessed considerable pathogenic power for pigs, but also that the disease so produced lacks several of the essential features of acute swine fever.

Experiments with filtered blood serum derived from pigs sick of swine fever, and which was free from B. Cholerae Suis show, on the contrary, that such serum produces illness in pigs with great regularity upon subcutaneous injection, and further, that the disease thus

set up possesses all the characteristics of the natural disease, including symptoms, lesions, contagiousness, infectiousness of the blood, and immunity in those animals which recover. From their experiments and their findings stated above they were forced to the conclusion that there exists in the blood of pigs suffering from acute swine fever some virus other than the B. Cholerae Suis, and that this virus is necessary for the production of the disease. All attempts to discover this virus have so far failed, and the virus, on account of its not being visible to the highest powers of the microscope, is often spoken of as an "ultravisible" or "ultramicrescopic" virus.

They further go on to state: "That the pathogenic power of the filtered blood is due to some living agent endowed with the power of reproduction, and not to the presence of a toxin alone, is assured, from the fact that the disease induced by the filtered serum is communicable from sick to healthy animals by association, and, moreover, from the fact that the disease induced by the filtered serum can be transferred to a second or even a third animal by inoculation, the serum being filtered each time previous to inoculation."

Dinwiddie, another American investigator, in 1912, carried out some rather interesting experiments to test the infectiousness of serum, and serum-free blood corpuscles, and the summary of his findings are as follows:

(1) That the virus of swine fever as it exists in the blood is prominently intracorpuscular in habitat.
(2) That it occurs in the serum or plasma by whatever mode they are obtained.
(3) That in shed blood it escapes from the corpuscles into the surrounding fluid either with or without hæmolysis.

He goes on to state: "The demonstration of the intracorpuscular habitat of an unknown virus leads to the assumption that the specific agent in that virus is protozoan in nature rather than bacterial, and from the results of his experiments alone, it might, therefore, be inferred, at least with strong probability, that the virus of swine fever is of this nature—an intracorpuscular protozoan organism."

He further states: "As a matter of fact, intracorpuscular hæmatozoa are present in swine fever, and, as far as my investigations have extended, invariably so, but much work requires to be done before any assertions can be made as to the relations of these organisms to the disease."

This is the state of our knowledge of the etiology of the disease, and it would appear to be only a matter of time before the mystery of the actual causal organism is elucidated. Great credit must be accorded to the investigators of the Bureau of Animal Industry of U.S.A., who have worked, and continue to work so assiduously on this problem.

Incubation. In natural outbreaks the incubation period is usually about 10 days, but may extend to 14; whereas in inoculation experiments with virulent blood disease usually manifests itself in from 4—6 days.

Semiology.

The symptoms are usually described by the various writers under the heads of acute, subacute, and chronic, but Mr. A. Holman-Berry, F.R.C.V.S., more accurately described them under the heads of peracute, acute, and chronic, (*Journal of Comparative Pathology and Therapeutics*, March, 1902), and it is under these heads I propose to describe them.

The term subacute as applied to swine fever lends itself to misapprehension.

Peracute. Under this head Mr. Berry included those cases in which (quoting his own description) through a large amount of virulent material having obtained entrance into the body at one time, the pig speedily sickens, and succumbs before the appearance of any appreciable manifestation of illness or the development of any morbid appearance specially indicative of swine fever on post mortem examination.

In these cases the usual history is that of sudden death, the owner or attendant finding the animal dead in the morning though apparently well the previous evening; or the animal may have been quite well at feeding time, and found dead a few hours later.

If the animals are seen during life they usually exhibit a rectal temperature of 107° F. to 110° F., with complete prostration, in fact, the animals appear completely intoxicated, and offer no resistance to handling.

This condition is almost invariably fatal, and is mostly seen in unweaned pigs, or young fat stores, and I have twice seen the condition in sows.

Acute. This type of the disease is most easily recognised, as its course is indicated by more or less typical clinical symptoms, and post mortem appearances. The condition is ushered in by a rise in temperature, the affected animals appear dull and listless, and show little or no inclination for food, and after a few mouthfuls return to the interior of the sty to lie down.

A short husky cough is a fairly constant symptom, best noted when first entering the pen, and rousing the affected animals. The cough is frequently followed by attempts at vomition, and in some cases the act is completed. This cough is in a good many cases not due to any abnormal lung conditions, but apparently reflex, and due to continued irritation of nerve terminals in the stomach, pharynx, and larynx. Great thirst is usually shown, the animal walking dejectedly round the pen sucking up any liquid at hand, preference being shown for any filthy pools of liquid excreta.

A transient looseness of the bowels followed by constipation may be first exhibited, to be again followed by a diarrhœa which becomes more and more profuse and fœtid as the disease progresses, till finally the animal may be found exhausted on the ground with liquid fæces trickling from the anus.

During locomotion a staggering gait is noted, the animal swaying from side to side, incoordination being more apparent in the hind quarters. In some cases the muscular weakness develops into complete or partial paralysis, till finally the poor brute becomes moribund and dies.

When there is a number of affected pigs in the same pen, they will usually be found huddled together in one corner for warmth with their bodies presenting a hot, clammy appearance, the individual animals showing increased irritability, evidenced by the squeals when one or other of the pigs makes the slightest movement.

Rigors, and shivering are usually present, the animals standing with head, ears, and tails hanging in a most dejected attitude, the emaciated appearance being most marked. Owing to the weak circulation skin discolourations appear on the ears and extremities.

A fairly constant symptom is a sticky catarrhal discharge from the eyes and nose, which as the disease advances sometimes appears quite purulent or mucopurulent, frequently gumming the eyelids together, and sometimes completely blocking the anterior nasal orifices. There is frequently photohobia, sometimes more or less opacity of the cornea, and in some cases blindness.

Another symptom shown, though not by any means common, but which must always be looked upon with the greatest suspicion when investigating suspected outbreaks, is the sudden onset of a weeping eczematous rash, which quickly dries up leaving circumscribed scabs scattered over the greater part of the cutaneous surface, In my experience this eczema is only seen in unweaned, or in newly weaned pigs. This condition is more often followed by the chronic type of the disease, though occasionally it is the onset of an acute attack.

When one has seen a typical case of the acute type just described, it is not mistakable, and the term "Swine Fever Expression" can be fully realised.

The acute type is very fatal, the mortality frequently reaches 80%, and the recoveries almost invariably become cases of the chronic type.

Chronic. Owing to the ease with which this type may be overlooked, it assumes all the more importance when a stamping-out policy such as has been adopted by the Board of Agriculture has to be taken into consideration; more especially when the risk of spreading infection by means of the dejecta is realised. Another risk to be considered is the liability of pigs affected with chronic swine fever to a recrudescence or exacerbation of the disease, as has been frequently noted.

Such chronic cases are fairly frequently sent for sale through public auctions, and the knocking about they receive in the carts, etc., to and from the sale, combined with the change of surroundings and food which a change of ownership involves, reacts on the animal economy to produce an acute attack, with disastrous results to any other non-immune swine with which they may have come into contact at their new place of abode.

In this type there is no definite train of symptoms on which to base a diagnosis, but the following clinical appearances must always arouse one's suspicions—unthrifty appearance, stunted growth, and intermittent diarrhœa of a watery nature. The appetite is usually capricious, although in some cases quite good; in fact, I have frequently made post mortem examinations on pigs in excellent condition, and with good appetite, in which the bowels were so badly affected with swine fever lesions that one wondered how it was possible for the animal, before slaughter, to be in such excellent condition. One would have expected the diseased condition to greatly interfere with the processes of assimilation and nutrition.

Skin Lesions. In discussing the symptoms, I have purposely left the question of skin discolouration to the last, and as there appears to be an erroneous idea that a skin discolouration of any nature is diagnostic of swine fever. Skin discolourations in swine are found to be associated with numerous diseased conditions other than swine fever, and on their presence or absence one must not place too much reliance.

There is one well defined lesion on the skin, however, which I have only seen in swine fever, and which must always be looked upon with grave suspicion—punctiform hæmorrhages situated principally on the abdomen, inside of thighs, hocks, and armpits. They may be somewhat scanty in number, but in some cases they are in thousands, and about the size of a pin's head, thickly disseminated, and well defined.

Post-Mortem Appearances.

These are best described under the heads of hæmorrhagic, ulcerative, and diphtheritic.

The hæmorrhagic type is the earliest manifestation of the disease, and corresponds to the initial stage of ulceration. As the name indicates, the lesions are essentially of a hæmorrhagic nature; a common picture which presents itself is multiple petechial hæmorrhages (size of a pin's head) scattered over the entire length of the mucous coat of the stomach and bowels, but perhaps more pronounced in the large bowel. The appearance is quite characteristic, and has been likened to the small pink or red spots on a peach, or the condition in tinned lobster.

The affected bowel may show no other abnormality, but fairly frequently (in a recent attack of the disease) the stomach, or bowel, or both may show an intense sero-fibrinous inflammatory exudation between the mucous and submucous coats. The mucous coat in this condition is usually swollen, congested and flabby, and imparts a velvety jelly-like feeling to the touch.

In two cases I have seen, which would come under the head of the peracute type, large submucous hæmorrhages up to the size of a five-shilling piece were observed; when incised they were about ¾-inch in thickness, and consisted of coagulated blood firmly adherent to the tissues. These tumour like extravasations were quite sharply defined, and presented a striking appearance on the greyish-white ground of the mucous coat of the bowel.

The petechiæ in this hæmorrhagic type of the disease are not, as a rule, confined to the intestinal tract, but are usually seen on the heart wall, kidneys, and sometimes in the lungs, and on the pleura, peritoneum, etc., in fact the picture is that often seen in hæmorrhagic septicæmia.

The petechiæ on the kidney is a lesion looked upon with great importance by our American *confrères*, and constitutes the so-called "Turkey's Egg Kidney"—a very apt description.

As previously stated, the petechial hæmorrhages correspond to the initial stages of ulceration, the small capillary hæmorrhages being in all probability determined by the presence of the swine fever virus. Owing to the continued presence of the virus acting as a specific irritant, necrosis of the surrounding epithelium takes place, the necrosed tissue becomes displaced with the resulting formation of a small ulcer. This process extends, affects the mucous coat and underlying structures, till finally a well defined ulcer is the result: This is usually circular in shape, but may be irregular, and varies in size from a pea to a five-shilling piece.

The so-called typical swine fever ulcer is pathologically a more or less circumscribed area of necrosis, accompanied by an increase of the connective tissue of the adjacent parts.

A true ulcer is formed frequently at the onset when the necrosed epithelium has become detatched leaving a small circular depression in the mucous membrane; and true ulcers are also seen when resolution is taking place, the entire necrotic centre becomes detached, and is passed out of the body with the fæces, leaving a depressed, often reddened centre, considerably below the surface of the normal mucous membrane. The appearance in some cases is as if a circular piece of membrane had been punched out.

When complete resolution has taken place, the healed lesions are indicated by smooth, dense, whitish, circular areas of cicatricial tissue, somewhat resembling vaccination marks.

The colour of the ulcers varies from light yellow, to brown or black, the colouring being determined by the presence of bile pigments and iron sulphides in the alimentary tract.

Sometimes the ulcers are concentrically ringed, giving an appearance similar to a section of calumba root, to which they are likened. Frequently the bowel wall shows great thickening owing to increase in the submucous connective tissue, the thickening in some cases having reached as much as 2-3 inches.

There is no definite rule with regard to the size, shape, colour, or number of the lesions, and their numbers vary from one to hundreds. The commonest site of ulceration is round the ileo-cæcal valve, and next in order come the cæcum and colon.

The diphtheritic form is characterised by the formation of diphtheritic exudation or deposit (rich in fibrin) on the surface of the stomach or intestines, accompanied by necrosis of the underlying mucous membrane, and sometimes the submucous coat.

Under ordinary circumstances the fibrinous exudation becomes firmly adherent to the mucous surface, presenting a firm, rough, grey or black surface, slightly raised above the surrounding normal parts.

In acute cases the stomach or intestine is often greatly

congested and swollen, and much thickened, due to hæmorrhagic exudation under the mucous coat.

The diphtheritic deposit may be only slight in amount, or in extensive patches, and in some cases affects the entire surface of the large and even the small bowels, diphtheresis being more common in the small bowel than ulceration. At other times it is in linear streaks or ridges running across the intestine.

Less common seats of lesions. It may be stated generally that lesions may be found in any part of the intestinal tract. The tongue, lips, hard palate, pharynx, and tonsils, frequently show punctiform hæmorrhages, or well defined ulceration, and ulceration and diphtheresis have both been noted in the œsophagus. Mouth ulceration, in my experience, chiefly affecting the free borders of the tongue is by no means uncommon, and seen most often in unweaned pigs.

Ulcers are also occasionally seen on the limbs below the carpus and tarsus.

The lungs sometimes show what has been termed a swine fever pneumonia, appearing as smaller or larger areas of consolidated, completely necrosed tissue, yellowish or greyish in colour.

Small necrotic areas are occasionally seen in the liver, spleen, and kidneys.

Lymphatic Glands. In acute cases the mesenteric lymphatics are almost invariably enlarged, and the seat of small hæmorrhages, and the enlargement of the precrural and inguinal groups can be detected by manipulation during life.

Diagnosis.

The diagnosis can only be definitely made by post-mortem examination, the finding of specific lesions being—with our present knowledge of the disease—essential as final evidence of the existence of the disease, and in some cases feeding with suspected material has to be resorted to. The microscope is of use in differentiating between swine fever and swine erysipelas, and the microscope is of use also in demonstrating the presence of B. Cholerae Suis, which is almost invariably present in swine fever.

When making enquiries in suspected cases, one must first take into consideration the history of the suspected animal or animals; the knowledge of direct or indirect contact with diseased animals is of great importance in assessing what might otherwise appear to be indefinite lesions.

In the peracute cases there are as a rule other pigs on the premises, and some of these in time develope the acute type of disease, and thus simplify matters.

In the chronic type our chief difficulties arise, and as there is no train of symptoms to guide one—the only history, as a rule, being one of continued unthriftiness—the only method is to slaughter in the hope of finding specific lesions. When making post-mortem examinations, too much stress cannot be laid on the necessity for examining the whole of the intestinal tract from mouth to anus, in order to eliminate possibility of a mistaken diagnosis.

Differential diagnosis. Under this head I wish to discuss briefly some conditions met with which at times make one pause at arriving at a correct diagnosis.

(1) *Tubercular ulceration of the bowels.* This condition is, fortunately, somewhat rare, and I can only recall six cases met with during the last eight or nine years. The affected animals are, in all cases I have seen, in an extremely emaciated condition, and coughing, the clinical picture being that of advanced tuberculosis.

Post-mortem examination reveals generalised tuberculosis; the mesenteric glands are invariably affected. The ulceration is chiefly confined to the large bowel, but in one case a few isolated ulcers were found scattered throughout the length of the small bowel.

The ulcer itself is a true ulcer, and varies from the the size of a pea to a shilling-piece. It is crater-like in appearance, with somewhat thickened lips, the centre filled with a yellowish-grey caseous-like material, which is easily washed out. Smears made from this material will usually show acid-fast bacilli.

(2) *Inflammation of the serous membranes.* This is a condition commonly met with in small stores, and affects all the serous membranes, but more especially the peritoneum. The disease is evidently of a specific nature, and I have often seen as many as 50 per cent. of the stores on a premises affected. The appetite is usually capricious, the affected animals appear dull and unthrifty, and more or less pot-bellied; sometimes a cough is present; the clinical appearance is somewhat suggestive of chronic swine fever.

Post-mortem examination soon reveals the cause of the trouble, the affected serous membranes show up white and roughened, with increase in the amount of fluids in the various affected serous sacs. The mucous coats of the stomach and bowels always appear normal.

A small bi-polar staining organism can usually be demonstrated in smears made from the serous fluids.

(3) *White scour in unweaned pigs.* This condition is frequently seen in those breeding establishments which feed on wash, but I have seen it in piggeries where no wash was used.

Scour suddenly appears in the unweaned pigs at about four to five weeks old, the excreta being always of a whitish or pale yellow colour.

This lasts as a rule from three to seven days, and will usually dry up of its own accord, but reacts on the pigs to such an extent as to throw them back for, in some cases, at least a month.

In unweaned pigs affected with swine fever the scour is usually preceded by a period of unthriftiness, and is of a different nature, the excreta being darker, more profuse, and fœtid, and the mortality usually high.

White scour is apparently, in the majority of cases, a dietetic trouble, and due to the unweaned pigs gaining access to the feeding trough. Some of the crude remedies are earth or ashes thrown into the sty, of which the suckers partake with evident benefit.

(4) *Swine erysipelas.* This disease is more often found in fatting and adult swine, though extensive outbreaks are sometimes seen in unweaned pigs, which are extremely difficult to differentiate from swine fever. A positive diagnosis is arrived at by inoculating a pigeon with scrapings from a spleen taken from an affected pig.

In fatting pigs the disease takes on different forms. In the acute type the animal is usually found dead in the sty, the entire cutaneous surface being of a deep violet colour. Post-mortem examination, as a rule, reveals an acute congested appearance of the whole of the lymphatic glands, the serous sacs containing excess of fluids. The heart usually shows ante-mortem clots, and the intestinal mucous membrane is usually normal, although in some few cases there are patches of enteritis (large bowel) with a thin, yellow or greyish coating of diphtheresis, which is easily rubbed off. The spleen is frequently enlarged. There is seldom, if ever, any extensive sero-fibrinous, or hæmorrhagic exudation under the mucous coat, and I never recall seeing petechiae in the stomach or intestines.

In the subacute type, commonly known as diamonds, blotches, measles, etc., the animal suddenly refuses food, developes a temperature, and breaks out in, as a rule, diamond shaped, reddish-blue, or purple blotches, well raised above the level of the surrounding healthy skin and sharply defined.

This condition lasts from two to five days, and recovery is the rule; but it frequently leaves valvular heart disease (Verrucose Endocarditis), which eventually

kills the animal; the symptoms shown are laboured respirations, and purple discolourations of the ears and extremities.

(5) *Verminous bronchitis* (Strongylus paradoxus) When this condition is met with in the form of an epidemmic amongst the stores in a piggery, the clinical appearances are at times somewhat suggestive of chronic swine fever. There is, of course, a pronounced expulsive cough, wasting, and occasional diarrhœa, and these symptoms with—as I have sometimes seen—100 per cent. of the pigs affected look very suspicious. Diagnosis should not be a difficult matter, however; the expulsive cough, with the appearance of the lungs on post-mortem should be sufficient for one to form an opinion.

(6) *Lime burn.* This condition is frequently seen in fat pigs carried by rail, and is caused by the placing of unslaked lime in the waggons. The pigs micturating, slake the lime, and when they lie down the parts of the body which come in contact with the slaking lime, such as the abdomen, sides, buttocks, etc., become burnt. The condition is only of interest to meat inspectors, but to the uninitiated, in the dressed carcase might be suggestive of swine fever.

(7) *Brine poisoning* is, in my experience, somewhat rare, and is worthy of notice only in that it might be mistakable for swine fever. The symptoms are—epileptic fits (animals attempting to climb the walls), profuse salivation, champing of the jaws. The fits increase in frequency, and the animal becomes paralysed, insensible, and dies. Post-mortem reveals acute gastro-enteritis, which is not accompanied by any diphtheresis. Evidence can usually be obtained of the affected animals having gained access to salt or brine, or of brine having been fed.

In making post-mortem examinations care must be taken by the uninitiated not to mistake plugged follicles on the ileo-cæcal valve, or plugged glands (solitary) for ulcers. The plugs in plugged follicles or glands can be easily squeezed out, leaving the empty follicle or gland as a fairly large aperture with a smooth healthy surface.

Methods of Spread.

It is generally recognised that the diseased pig is the chief source of spread of swine fever, and on this account it behoves veterinary inspectors at markets and sales to look with the utmost suspicion on any pigs of an unthrifty nature, in fact, one is justified in saying that no unthrifty pig should be allowed in any market or saleyard.

Any person or thing becoming contaminated with dejecta from a diseased animal may be the means of spreading the disease, and you are all sufficiently conversant with the various objects without my enumerating them.

One fact of which you are all doubtless aware, is the frequency with which outbreaks of swine fever show themselves amongst pigs fed on camp swill, and the refuse from hotels, unions, etc., without, in a great many cases, any source of origin being traceable. In some cases, doubtless, the disease has been introduced with a carrier pig, but there are other cases in which the carrier pig must be eliminated, as the disease will appear suddenly four to five months after the purchase of the last pigs.

It was this peculiarity of swine fever which prompted Mr. Hanbury (who was at that time President of the Board of Agriculture) in March 1901, at a meeting of the Taunton Farmer's Club, to make an incursion into the realms of veterinary pathology, and state that "he thought there were two forms of swine fever, one that worked out spontaneously, and the other that was due to the existence of microbes." Even at the present time we are still often confronted by laymen with the same spontaneous origin of the disease.

When the question of swill feeding is looked into carefully, it will be noted that some feeders cook all the swill, whilst others feed it raw, and that the feeder on raw swill is the one whose pigs more frequently contract swine fever.

A good case in point happened in Birmingham some four months ago. One of the railway companies keep all their own hotel refuse for feeding their own pigs, of which they keep about 50-60. The hotel servants have special instructions never to place any bacon rinds or ham trimmings in the pig tub, but an unfortunate chain of accidents happened one morning. A new servant dumped a lot of bacon rinds and ham trimmings into the pig tub, these were carted to the piggery, and fed raw by a new pig attendant. The sequel occurred a fortnight later, when several pigs were noticed to be off feed, and in the course of another week every pig on the premises was down with swine fever. In this case no new pigs had been brought on to the premises for the last three months. This is only one of numerous similar cases that could be quoted.

When one examines camp swill it is usually found to contain a large percentage of bacon rinds and ham trimmings, the majority of which will be from hams and bacon of American origin. Knowing the prevalence of swine fever in America, it is quite feasible that a percentage of the green bacon landed in this country is from infected pigs, and the hurried curing process it undergoes before sale, cannot penetrate very far into the tissues. It is, to me, quite feasible also that some of the bacon and hams retain the infection, and when fed in uncooked swill will in some cases produce disease.

"*Carriers.*" Sufficient evidence is now available to warrant our attaching importance to the "carrier" pig in the spread of disease. The carrier may be one that has recovered from an attack of the disease, and is left with some open, unhealed lesions in some part of the alimentary tract.

There is reason to suppose, however, that a pig may be a carrier without possessing any demonstrable lesions whatever. In this connection anyone with a fairly large experience of swine fever can recall cases occurring in unweaned pigs, and the dam apparently healthy, despite the fact that no source of origin of infection could be traced. In a large percentage of such cases I am of opinion that the dams are acting as carriers, and transmit the disease to their offspring.

Treatment.

The treatment of swine fever since the introduction of the anti-swine fever serum has taken on a new importance, the discovery having placed in the hands of the veterinary profession a most valuable agent for combating the disease, and one which in the course of time promises to become more valuable.

Its value at the present time as a saver of pig life is enormous, and with improved methods, which are bound to be discovered in the course of time, there will probably be in our hands an agent which will bring nearer the day when swine fever will not be looked upon as a scourge to the pig keeper, and an economic problem to the nation.

In the treatment of swine fever by means of the protective serum two methods have been adopted:—(1) The single, or serum alone method; (2) The double or simultaneous method.

In the single method serum only is injected, the result being the production of a passive immunity lasting about 10 days. In America it is stated that the passive immunity thus produced lasts sometimes as long as 3 to 4 months, but the experience gained in this country does not bear this out, and the safest outside limit must be placed at 10 to 14 days.

In the double method the animal receives a dose of serum and virus (virulent blood) at the same time, which produces a mild attack of the disease from which the animal usually recovers, leaving it with an active immunity which lasts, as a rule, for the remainder of the animal's life. The great objection to this method is the fact that new centres of disease are established when it is applied to clean herds. Nevertheless in U.S.A. it is somewhat largely practised.

Owing to the impossibility at present of standardising or sensitising the virus, the deaths from this method are sometimes high and the experience gained in this country does not warrant the adoption of this method except in special cases.

It is to be noted that good results have been obtained by feeding virulent blood instead of injecting it intramuscular, the dose of virulent blood when given *per orem* being much larger than when injected intramuscular.

Swine that have been injected with serum and then exposed to suitable infection, as a rule, contract a mild attack of the disease from which they recover with an active immunity conferred, and the risks attending this method are not so serions as the simultaneous method, although the same object is attained—active immunity.

In some cases the treated swine do not show any reaction whatever, and in others there is only slight indisposition for a few days, depending probably on the amount and virulence of the infection to which they are exposed. In some few cases active disease may be set up in the exposed swine, resulting in several deaths, and this may be due to one of several causes, or to several of the causes acting at the same time.

1. The treated animals may be extremely susceptible.
2. The virus to which they have been exposed may be too virulent, or the amount of infection too heavy.
3. The serum shows variations in protective power owing to the impossibility of standardising. Though all serum is tested before being sent out, it is quite understandable that the action cannot be uniform in all cases when one also realises the varying degrees of virulence met with in the different outbreaks.

Other factors, such as improper treatment, or feeding of the animals whilst undergoing treatment, will all have a bearing on the result.

The method of infection by mixing is adopted generally by the Board of Agriculture, and it is to this method that I wish to chiefly confine my remarks.

Clinically affected swine should never be injected with serum, as the evidence does not point to serum having any curative effect whatever in such cases.

In the cases where all the diseased animals are destroyed and thus none are left for mixing, it is necessary to re-treat all the pigs on the premises at intervals of ten days, and on heavily stocked premises this becomes an expensive item when the cost of serum is taken into consideration; so that in the majority of cases the best results and at least cost are obtained by keeping a sufficient number of diseased animals for mixing

To obtain the best results from treatment it is necessary to get into touch with the outbreak at the onset, before too large a percentage of the swine on the premises are affected, and it behoves practitioners to impress on their clients the necessity for reporting early if they are to obtain good results.

When mixing is adopted in stores or adult swine it is necessary in order to insure the production of an active immunity in the serumed pigs that there be at least about 10 to 12 per cent. diseased to healthy pigs, and the pigs must be in an enclosed yard or run, not too large, to ensure all coming into contact with infection. If the mixing is incomplete, or the amount of virulent material not sufficient in quantity, the results will be unsatisfactory, and it will be found that a number of the pigs will fall subsequently if exposed to infection.

In the case of pregnant sows, owing to the risk of producing abortion, it is sometimes advisable to isolate and rely on repeated injections of serum.

The unweaned pig presents the greatest problem in treatment, despite the fact that one can inject repeated doses of serum without ill effects, and I have frequently injected 10 c.c. of serum into strong three days old suckers. The trouble with the sucker is that it does not appear to manufacture it own immune bodies when exposed to infection after treatment with serum, and these must therefore be supplied by repeated injections of serum at 10 to 14 days intervals. As the unweaned pig gets older, the power of manufacturing immune bodies does develop slightly, but this power does not become fully developed till after weaning time.

When trying to actively immunize unweaned pigs one must be careful not to expose them to infection whilst too young, and then the iufection must not be too heavy. Some low form of the disease which one would get by allowing contact with infective litter after it has been a few days cleared from diseased pigs is one of the best methods.

It is stated by the American writers that the young of immune sows possess a greater or less degree of immunity for the first few weeks of their existence, but that this immunity gradually diminishes until shortly before, or at weaning time it is quite lost.

In the case of large breeding establishments where unweaned pigs are continually arriving, the question of treatment by means of serum is somewhat complicated, but breeding operations can be successfully carried on despite the continued presence of the disease. Serum has no harmful effects whatever on healthy pigs; it cannot produce abortion in pregnant sows, and one need not fear injecting serum into pregnant sows whatever their stage of pregnancy.

If abortion does occur it is due, in the majority of cases, to an attack of the disease, or in some cases to rough handling.

The most convenient place for the injection in unweaned pigs and small stores is direct into the ham, and in pigs too large to be easily held up by one man, into the loose skin behind the ear.

There is no need to impress on operators the necessity for working with sterile instruments, and also the need for disinfecting the site of the operation. The most convenient method for the latter purpose is to paint with Tr. Iod.

Methods of control. With suckers and small stores one should never have any difficulty, and the usual and most convenient method is to hold the animal securely by both hocks, with the abdomen facing the operator (somewhat similar to the method of holding for the operation of castration).

Some assistants catch the fore quarters of the pig between the knees, but the less restraint one places on the animal, the less the struggling, and the less likelihood there is of injuring the bone through the needle penetrating too far.

In the case of sows and boars, the best and most convenient method, and one which has never yet failed me, is to place the animal to be operated on in a corner by means of a door, the angle of two walls and the door forming a triangle from which the animal cannot escape. This method entirely eliminates the necessity for roping, which is not an enviable job at any time; while in the case of pregnant sows there is absolutely no risk of producing abortion through rough handling. Once the animal is penned in this manner, by careful handling and quietness the injection can be made without any trouble behind the ear. For this method to be successful it is absolutely necessary that the door used be close boarded, as anyone with experience in handling pigs knows how a pig when cornered will attempt to escape through any small aperture.

When treating strong stores, or pigs too large to hold conveniently by the hind legs as previously described, I find the best and quickest method is to secure as many as possible behind the door as in the method described for securing sows. If the space is packed as tight as possible with the animals to be operated on, one will find that he can lean over the door and inject one pig after another, a distinguishing mark being placed on each pig as it is injected. By this method I have done as many as 60 in the hour. Here again the easiest and best seat of injection is behind the ear.

When treating pigs by the simultaneous method it is often found most convenient to have the animals held securely on a bench, one assistant holding the fore legs, and another the hind, so that the serum can be injected first into one ham, and the virus into the other.

Efficacy of Serum.

As showing the efficacy of anti-swine fever serum, I will now give briefly two cases. The first occurred in May, 1916, and the premises are still under observation. My reason for giving it is to show that breeding operations can be successfully carried on despite the disease.

When disease was first reported to the Board there were 534 pigs on the premises, all of which, with the exception of the fatting pigs, were running out in the fields. Disease had been in existence on these premises for at least a month, and was thus very widespread.

All the fatting pigs that were ripe for slaughter were dressed for food, and the remainder of the pigs on the premises were treated with serum, and on May 6, 1916, the following pigs were left, and had been treated :—

Boars.	Sows.	Unweaned.	Fatting.	Stores.	Total.
4	69	153	—	223	449

On Feb. 2, 1917, there were on the premises :—

4	53	106	152	120	435

During the nine months these premises have been under observation there have been :—

Born.	Moved on.	Moved off.	Slaught'd for food.	Lost.
492	228	109	398	242

(Died or slaught'd as useless : Boars 1, Sows 7, Suckers 96, Fatting 6, Stores 132).

Of the unweaned pigs, only suckers that survived the first week or ten days have been included, owing to the large number which are overlaid by the dams.

The pigs moved on were all strong or medium stores which were placed in the fatting pens after running out for about a month. They all received a dose of serum previous to being moved on, and were as far as possible exposed to infection.

The pigs moved off were sent to another of the same owner's farms, and were penned up for fatting.

The number of deaths appears rather high, but when the number of unweaned pigs which were overlaid (about 50 per cent.) is deducted, and in the stores quite 30 out of the 132 died from septic peritonitis, the result of faulty castration, the deaths from actual swine fever are considerably reduced.

The largest number of deaths was amongst the stores, it will be noted ; the deaths mostly occurred immediately after weaning, despite the fact that a large percentage of the suckers were exposed to infection during the time they were on the dams, thus pointing to the fact that unweaned pigs do not manufacture their own immune bodies till after weaning time.

Owing to the wide distribution of the stock in this outbreak certain difficulties have arisen which could possibly have been obviated on premises where the swine are all in close proximity.

In the first place it was not always possible to expose all stores to a sufficient infection whilst under serum, with the result that a certain percentage received only a passive immunity, and when, as strong stores, they came into contact with immune pigs some of which were carriers, they fell with disease, and thus a recrudescence was set up.

Another factor which must be considered is the necessity for the frequent movement of the various classes of pigs, *e.g.*, the movement and mixing of stores at weaning time, the movement of strong stores from the pastures to the fatting pens, and the movement of sows to the boars. All these movements increase the risks of recrudescences, owing to the danger of a percentage not having been exposed to a heavy enough infection and thus only receiving a passive immunity.

The second case, the particulars of which were given me by Mr. A. Holman-Berry, was in connection with a large asylum on which breeding operations were repeatedly having to be suspended owing to outbreaks of swine fever.

For some considerable time stores had been brought on in batches and immunised by the double method, with marked success, the losses averaging from 2 to 5 %.

The asylum authorities expressed a desire to recommence breeding operations ; 20 immunised gelts were chosen, and a boar purchased which was also immunised by feeding. The authorities were advised not to purchase any more stores for immunising ; but being short of stores 50 were purchased and vaccinated in June, 1916.

Up to August 23rd, 1916, there were no deaths in the last 50 vaccinated, but a few had not made the progress in growth and condition that was expected.

A visit was made on Sept. 26th, 1916, in consequence of one of these 50 having died, and post-mortem examination revealed extensive lesions of swine fever.

The sows commenced to farrow on another part of the premises in July, 1916, and by Sept. 26th (the time of the visit) 140 pigs had been born, of which 50 were weaned, and placed in two yards (A, B) early in September, and with the exception of two recently weaned litters the rest were on the sows. One pig in one of the litters was not well on Sept. 26th, had rapidly lost condition, and on Sept. 30th a post-mortem examination was made, and suspicious lesions found. One or two others looked a little "off bloom."

Serum was injected to the two recently weaned litters, and all the suckers on the sows, but not into the 50 (A, B). This timely injection stopped the disease.

Next, one or two in the 50 lot of stores were reported ill, and found to be suffering from swine fever.

All the young pigs were treated with serum with success, and 61 of the suckers were weaned and placed in two yards (C, D) adjoining the 50, so that we had 111 pigs in four yards, as follows :—

A 25.	One ill and recovered, but stunted, leaving		25.
B 25.	Two died	„	23.
C 30.	One died	„	29.
D 31.	Two died	„	29.

In consequence of disease appearing in D, two died, and one ailing pig in C died later.

Serum was again given, as it was difficnlt to know what standard of immunity was present in the various litters which went to make up the 61 (C, D). These four pens have done well, and will be ready for slaughter in March, 1917.

This left four pens of recently weaned pigs including the original lot of six in which disease first appeared, and of which one died and one was killed, leaving four healthy.

One litter of 4-5 went wrong, two dying in fits, and then another litter of eight went wrong, two dying.

The same question of delayed infection, or uncertainty of degree of immunity, again presented itself, so serum was again injected into three of the litters, excluding the original litter in which disease first appeared, and the lots were all mixed together.

One of the eight was ill a fortnight later, and was killed, extensive lesions of swine fever being found. All has gone well since except that several of an 18 lot are small and rough looking, but feed well. It will thus be seen that out of 140 pigs born, 124 were saved.

During the outbreak all the breeding and fatting stock remained healthy.

PREPARATION OF SERUM.

Finally, a brief account of serum manufacture will not be out of place.

Full-grown pigs are hyper-immunised as follows :—

(1) *Vaccination.* The animal receives 1 c.c. virulent blood obtained from a pig suffering from acute swine fever, and at the same time from 30 to 50 c.c. of anti-swine-fever serum.

(2) Three weeks later the animal receives 300 to 500 c.c. virulent blood, injected usually into the neck, behind the ear.

(3) Ten to fourteen days later the animal again receives 300 to 500 c.c. virulent blood.

(4) Ten to fourteen days later the animal is again injected with 300 to 500 c.c. virulent blood, and now constitues a hyper-immune pig.

A fortnight after the last dose of virulent blood the animal is bled for serum for the first time.

Each pig is usually bled about five times before the final bleeding at slaughter, and is usually re-inforced with 300 to 500 c.c. virulent blood after each bleeding. The animals are usually bled from the tail.

The above procedure is, of course, subject to modification.

The A.V.C. Comforts Fund.

Dear Sir,—I have pleasure in sending further lists for favour of publication if possible in this week's *Veterinary Record*. I would like to specially thank those kind friends of the A.V.C. in Scotland, who have so generously sent in subscriptions through Col. Stratton, as shown in this third list as herewith appended. Also on behalf of the Comforts Fund, I have gratefully to acknowledge a large consignment of woollen comforts which has been sent out direct to France by "The Lord Provost's Committee for Comforts," Edinburgh, and which have been distributed amongst N.C.Os. and men of the Mobile Sections. Letters received inform me that the comforts are "*magnificent*," and are "greatly appreciated." It has been largely due to the kind interest of Major Archibald Baird, A.V.C., Edinburgh, that this very generous contribution has been received for A.V.C. men on active service.—Yours truly,

ADELAIDE M. MOORE.

Strathyre, Parsifal Road, Hampstead, N.W.

Subscriptions received since list published March 3rd.

	£	s	d
Mrs. England	2	2	0
Mr. F. Henson Gibbings (F)	2	2	0
Mr. T. E. Loughran	1	1	0
Mrs. K. C. Butler	2	2	0
per Capt. T. G. Heatley, A.V.C.: contribution, Officers, N.C.Os. and men, Northumberland Vety. Hospital, Newcastle-on-Tyne	5	5	0
Mrs. M. C. Chichester	2	0	0
Mrs. F. W. Hunt	1	1	0
Mr. W. Roots	2	2	0
Mrs. Newall	5	0	0
Mr. M. Robinson	1	0	0
Mr. M. G. Byerley (F)	1	1	0
Mr. H. Morphew	1	1	0
Maj. R. Porteous, A.V.C.	2	2	0
per Maj. H. E. Gibbs, A.V.C.: contribution, No. 8 Veterinary Hospital	5	0	0
per Mr. Matthew Lee (Churchwarden): collection, Parish Church, Amble	1	3	0
per Lt.-Col. F. C. Stratton, A.V.C. (3rd list):			
Capt. Jas. Andrew, A.V.C. (T.), Paisley	£3	3	0
Mr. Jas. Borthwick, Kirkliston	1	1	0
Mr. W. W. Campbell, Glasgow	1	1	0
Mr. D. Crabbe, Fraserburgh	1	1	0
Mr. Jos. Garvie, Montrose		10	6
Mr. D. Hamilton (F), Hamilton	1	1	0
Maj. A. Hammond, A.V.C., Ayrshire	1	0	0
Capt. S. G. Howard. A.V.C. (T) Glasgow	2	0	0
Mr. R. Knight, Dunfermline	1	1	0
Mr. D. Lauder, Joppa	1	1	0
Mr. J. Lindsay, Dumfries	1	1	0
Capt. J. R. McCall, A.V.C. (T), Glasgow	1	1	0
Mr. J. McClemont, O. Cumnock	1	0	0
Capt. J. D. McGregor, A.V.C., (T)	1	1	0
Capt. Jas. MacIntyre, A.V.C. (T) Glasgow	1	1	0
Capt. D. G. MacLeod, A.V.C. (T) Glasgow	1	1	0
Maj. A. Wilson, A.V.C., Leith	1	1	0
	20	5	6

Parcels received since March 3rd.

Mrs. Kay-Lees : 2 pr. Socks. Mrs. Bibbey : prs. socks
Mrs. G. Burke Savage : 23 pr. Socks
Mrs. Leckie : 6 shirts, 6 pr. socks, 10 pr. mitts (Fd. wool)
Mrs. Barber (Brewood), Mrs. Greatbatch, Mrs. McIntyre: Mufflers, helmets
Mrs. Blue (Belfast), Mrs. Cunningham, Miss Nugent, Mrs. Aiken, Miss Ellison : 25 pr. socks (Fund wool)
Mrs. Rutherford : 3 pr. socks
per Mrs. Ewing Johnston (Belfast), (from Mrs. Harold Barbour) : 54 pr. socks, 7 mufflers
Mrs. Alison Brown (Invergordon), Mrs. Trewin, Mrs. Thom : 9 pr socks, 2 mufflers, 1 pr. mitts.

Calf Rearing: a Promising Innovation.

Writing in *Farm and Home*, a contributor, over the signature of "Old Breeder," notices a practical scheme for bringing together the buyers of well-bred calves and those who are in a position to supply them. He has long held the opinion that intervention of responsible societies to act as mediums between breeders and rearers of calves would be far better than legislation, or departmental orders, if combined with inducements in the shape of prizes given by the leading show societies for the largest and best collections reared. There was always the difficulty put forward—and a real one, too—that calves from a distance might not be worth having without some guarantee of their being fairly well bred, and that obstacle now seems to be happily overcome.

The Preston and District Farmers' Trading Society, Limited, is situated in one of the best possible localities for this purpose, for thousands of good Yorkshire cows produce calves there which are not wanted at home. Besides this, there are nearly 30 of the pedigree bulls subsidised by the Board of Agriculture being used in the neighbourhood, and the Society will undertake to collect calves sired by them, and send them off to farmers in lots of 6, 12, 18 or upwards at a fair price. Buyers should apply for full information to Mr. John James, Trapp Farm, Carleton, Poulton-le-Fylde.

[This is one of the examples of scandalous waste for lack of a little organisation which has been going on for years, and which is of the same nature as some others which have thrown into the hands of the more attentive Germans considerable profits on the manufacture and re-sale to us of food-stuffs, drugs, etc., which might quite well have been retained for our own people].

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.	Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange. ‡		Sheep Scab.	Swine Fever.	
	Out-breaks (a)	Animals.	Out-breaks (a)	Animals.	Out-breaks (b)	Animals.	Out-breaks (b)	Animals.	(b)	Out-breaks (a)	Slaughtered. *
GT. BRITAIN. Week ended Mar. 10	12	13			2	3	72	175	22	53	13
Corresponding week in 1916 ...	16	18					60	145	4	87	214
Corresponding week in 1915 ...	17	17							7	55	206
Corresponding week in 1914 ...	24	25	4	34	3	12	52	101	3	63	506
Total for 10 weeks, 1917	139	166			7	12	818	1778	294	411	137
Corresponding period in 1916 ...	133	154	1	24	15	46	834	2103	136	791	2380
Corresponding period in 1915 ...	172	192			5	11			114	746	3043
Corresponding period in 1914 ...	191	205	9	65	22	59	801	1519	119	550	5021

‡ The Parasitic Mange Order of 1911 was suspended from 6th August, 1914, to 27th March, 1915, inclusive.
(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked :—Essex 1, Glamorgan 2
Board of Agriculture and Fisheries, Mar. 13, 1917. Excluding outbreaks in army horses.

IRELAND. Week ended Mar. 10	...	...	...	...	...	...	Outbreaks 2	7	7	32
Corresponding Week in 1916 ...	...	...	...	...	...	...	...	12	8	36
Corresponding Week in 1915 ...	...	...	...	...	...	...	...	10	8	14
Corresponding Week in 1914 ...	...	...	26	393	...	...	...	10	10	44
Total for 10 weeks, 1917 ...	2	2	...	...	1	1	9	138	42	277
Corresponding period in 1916 ...	1	5	...	...	...	...	18	154	44	141
Corresponding period in 1915 ...	...	...	...	...	...	...	10	141	47	262
Corresponding period in 1914 ...	...	...	28	421	...	...	25	228	44	268

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Mar. 12, 1917
NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

Pet Dogs.

The Pet Dog Society held its show at Lambeth Baths, S.E. (a few months ago). The show attracted a large attendance of those interested in the kind of dog nowadays understood to come within the term "pet," including greyhounds, Pekingese, Pomeranians and Samoyedes, pugs, poodles and Yorkshire terriers. All the animals shown were sleek and well-groomed, and there were times when the luxury in which the animals are obviously kept stirred unpleasant thoughts of the hardships which are now the lot of so many men.

The contrast, for instance, between the dug-out and the trench in winter and the exhibition home of the pet dog was striking. War correspondents have described the discomforts of the one; what pen shall do justice to the other—to the stall tricked out with pink silk ribbons, in which, on a mohair mat of the same colour, was a ball of fur? Round this exhibit stood seven people in evident awe and wonder. "Of course I've never seen anything like him," said one woman. The talc window was opened and the ball of fur was taken out. "But we mustn't keep you out long, must we, little one?" said the owner. Then was produced a leather dressing case in which were the toilet articles of the dog. There were silver-mounted brushes, hair curlers, thermos flasks, two suits of canine clothing, and handkerchiefs. A saucer was produced from the dressing-case and washed over with hot water from a thermos flask. A cloth was put down on the bench and the saucer placed on top of it. Then the dog deigned to drink. Outside another cage was a bunch of violets, perhaps to complete the colour scheme. Most of "the pets" had dainty cushions and close-fitting coats, while some were ornamented with ribbons of blue or pink.

Standing in front of another kennel was an exhibitor busily engaged carving a chicken and feeding a small dog which was somewhat disdainfully refusing the titbits. Asked what was the matter, the reply was, "Oh, he's a naughty dog and won't even eat his tripe boiled in milk."

The owners of pet dogs point out that the destruction of their animals would mean ruin to a large and growing industry, and that the amount of food eaten by the dogs would not materially increase the available supply for human beings.—*The Times.*

SUBSCRIPTIONS TO R.C.V.S.

The Secretary of the Royal College of Veterinary Surgeons begs to acknowledge the receipt of the following subscriptions for 1917 :—

J. Cunningham, Capt. A.V.C. (1916, 1917)	£2	2	0
T. Dobie, Birkenhead	1	1	0
T. A. Dobie, Capt. A.V.C.	1	1	0
W. Dobie, Birkenhead	1	1	0
G. R. Dudgeon, Sunderland	1	1	0
J. Jarvie, Carluke, Lanark	1	1	0
W. Roots, London, S.E.	1	1	0
A. Sievwright, Tarland, Aberdeenshire	1	1	0
P. Snaith, Bishop Auckland	1	1	0
B. M. R. West, Capt. A.V.C.	1	1	0
J. S. Young, Capt. A.V.C.	1	1	0
Previously acknowledged	437	15	0
	£450	7	0

Prosecution by the R.C.V.S.

At Barton Police Court, on Monday 5th inst., before Mr. F. Hopper (in the Chair), Mr. H. Woodcock, Mr. R. C. Robinson, and Mr. J. Barraclough, Harry Barnaby, the well-known farrier, of Worlaby, was charged that on November 20th, he unlawfully did take and use an addition and description that he was a duly qualified veterinary surgeon. Mr. D. Locking prosecuted, and Mr. John Stow, of Hull, defended. Mr. Stow consulted with his client and pleaded guilty. It was stated that on the above date, Capt. F. C Nicholson, breeder of Lincolnshire long-wool sheep, of Horkstow, called defendant in to examine three ewes, which were to go to Ireland. After examining them defendant gave a certificate that they were free from disease. He was then asked to sign the necessary certificate issued by the Board of Agriculture, but not being a duly-qualified veterinary surgeon, he demurred, telling Capt. Nicholson that there was a duly qualified veterinary surgeon at Barton. Mr. Nicholson offered to bear any consequences, and defendant ultimately signed the certificate, and this was the offence complained of. Mr. Stow said defendant had been in practice for 33 years, and this was the first charge against him. His father was a veterinary surgeon before him, and defendant should have qualified. He worked for all the farmers within a ten mile radius of Worlaby, and indeed his practice extended as far as Caistor.—Defendant was fined £2, including costs.—*The Hull Times.*

Joint-ill in Foals.

In the Annual Report of the Clydesdale Horse Society, recently issued, it is stated that in view of the prevalence of this disease, and the consequent heavy losses, the Council appointed a special committee, under the convenership of Mr. George A. Ferguson, Surradale, Elgin, to investigate the causes of, and, if possible, discover a remedy for the disease. A sum not exceeding £500 was placed at the disposal of the Commiitee for the purpose.

The Committee had been fortunate in securing the co-operation in their work of leading members of the veterinary profession and prominent physiologists and bacteriologists in Glasgow, Edinburgh, and Aberdeen Universities. They had also secured the cordial co-operation of the Board of Agriculture for Scotland, and a scheme of investigation and inquiry had been drafted for the season of 1917. The collection of samples and cases would be undertaken along uniform lines by committees organised in the three centres named, under the convenership respectively of Prof. Charnock Bradley, of the Royal (Dick) Veterinary College, Edinburgh; Prof. John R. McCall, of the West of Scotland Veterinary College, Glasgow; and Mr. William Brown, M.R.C.V.S., of the North of Scotland Agricultural College, Aberdeen.

Wourali or Curare Poison.

In the fifth edition *Wanderings in South America*, by the great naturalist, the late Charles Waterton, published by B. Fellowes (pp. 28-29), a most interesting account is given of his stay amongst the Maconshi Indians in Guiana, who used the blowpipe with arrows or darts poisoned with this deadly vegetable poison, commonly called wourali. Also in Waterton's *Essays on Natural History*, Fifth Series, published by Longmans, Green, and Co., 1851, on p. 304 is given an extract from the *St. James' Chronicle* on the "Ass Wouralia," which was experimented on at the Veterinary College, London, in 1811. This ass was poisoned by wourali. and then when apparently dead was restored to life by means of artificial respiration, the operation lasting for four hours. This ass lived until 1839, being well cared for at Walton Hall, Yorkshire.—HENRY C. MARTIN, M.D., Exmouth, in *The Spectator.*

ARMY VETERINARY SERVICE.

Extracts from *London Gazette*,

WAR OFFICE, WHITEHALL, March 12.

The King has been pleased to award the Meritorious Service Medal to the following in recognition of valuable services rendered with the Armies in the Field:—

* * * * *

S.-Maj. J. Bain, 25; Staff-Sgt. D. E. Dorward, SE/4189; Pte. (actg. Sgt.) H. McLoghry, SE/914.

Buckingham Palace, March 14.

The following had the honour of being received by the King this morning, when His Majesty invested them with the Insignia of Companions of the Orders into which they have been admitted:—

THE DISTINGUISHED SERVICE ORDER.

* * * * *

Major Samuel Fallin, A.V.C.

REGULAR FORCES. ARMY VETERINARY CORPS.

Mar. 9.

Temp. Capt. H. S. Howard-Jones relinquishes his commission on account of ill-health, and is granted hon. rank of Capt. (March 10).

Mar. 12.

To be Hon. Lieut.:—H. A. Crowe (March 2).

CANADIAN A.V.C.

Mar. 13.

Temp. Maj. A. D. McLean, from a Can. Inf. Bn., to be temp. Capt. (Feb. 5).

TERRITORIAL FORCE, ARMY VETERINARY CORPS.

Mar. 9.

Lieut. to be Capt.:—D. G. McLeod (March 6, 1916) (substituted for that which appeared in *Gazette* of Sept. 15, 1916).

Lieut. to be Capt.:—H. Gibson (May 28, 1916) (substituted for that which appeared in *Gazette* of Sept. 15, 1916).

Lieut. to be Capt.:—G. E. Norgate (June 2, 1916) (substituted for that which appeared in *Gazette* of Sept. 15, 1916).

The following casualty is reported:—

ACCIDENTALLY KILLED—Pte. W. J. Eacey, 03514 (Forest Gate, E.)

OBITUARY.

ROWLAND W. PITCHER, M.R.C.V.S., Eastbourne.
Graduated, Lond: Dec., 1871.

Mr. Pitcher died on Feb. 26th, aged 65.

Original articles and reports should be written on one side of the paper only and authenticated by the names and addresses of writers, not necessarily for publication.

Communications for the Editors to be addressed
20 Fulham Road, London, S.W